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A Site Specific Advisory Board, Chartered under the Federal Advisory Committee Act

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September 6, 2013

David Huizenga

Senior Advisor for Environmental Management

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U.S. Department of Energy

1000 Independence Avenue

Washington, D.C. 20585

Kevin Smith, Manager

U.S. Department of Energy, Office of River Protection

P.O. Box 450 (H6-60)

Richland, WA 99352

Re: Leaking Tanks

Dear Messrs. Huizenga and Smith,

Background:

The U.S. Department of Energy – Office of River Protection (DOE-ORP) has recently confirmed that interim stabilized Single-Shell tank T-111 has resumed active leaking. The former Secretary of Energy also indicated that five other Single-Shell Tanks may be leaking. DOE-ORP is reassessing the status of these and other Single-Shell Tanks.

Significantly, DOE-ORP announced at the Tank Waste Committee meeting on April 10, 2013 that the cause of the leak in the bottom of Double-Shell Tank AY-102 was likely due to corrosive materials on the tank floor. Waste has leaked into the annular space and is now in contact with the thinner, secondary tank liner. This contact is a concern due to the shorter design service life for the thinner secondary tank compared to the inner primary shell, coupled with the inability to monitor the conditions of waste that may have leaked under the tank. There is also potential to compromise an active air cooling system which helps regulate thermal heat generated by tank contents. As occurred with the primary tank, there were extensive weld repairs required on the secondary tank when built.

Tank waste at Hanford has a history of chemical change over time resulting in the waste deviating from specification controls and becoming corrosive. In addition, because of tank design and construction, there is no way to directly assess the condition of the secondary tank under the refractory, the chemistry of the waste between the tanks, or to adjust the chemistry and bring it into balance. As a result, corrosion protection of the secondary tank

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cannot be assured. A recent Ecology inspection field monitoring report (AY-102 201303-14 Riser 83 Field Monitoring Report) indicates that the waste in the annulus space has continued to slowly increase over time.

The RPP-ASMT-53793 Rev 0, *Tank 241-AY-102 Leak Assessment Report* indicates that the contents of AY-102 have not been sampled since 2005. The history of ongoing chemical changes in tank waste, the lack of sampling of waste in contact with the bottom of the tank, and the occurrence of a leak in the floor of a double-shell tank demands a more aggressive chemistry and corrosion monitoring program.

The RPP-ASMT-53793 Rev 0, *Tank 241-AY-102 Leak Assessment Report* indicates that the waste in the tank is thermally hot as a result of the addition of waste from C Farm tanks. It is evaporating up to seventy-two gallons of water per day. Based on previous history, the waste liquids alone cannot be pumped out of the tank to minimize leakage. This action would cause the remaining sludge to overheat, chemically react, and possibly lead to flammable chemical generation and other problems. However, much of the supernate can be safely removed. Therefore, when waste is removed, all of the waste must be pumped, both liquids and sludge. Sluicing the waste may also lead to increased leakage. If pumping is delayed, the rate of leakage may increase through additional corrosion. Pumping of AY-102 is urgently required.

Both state and federal regulations (at WAC 173-303-640) require that leaking tanks be pumped as soon as practicable, though there is not yet agreement on that timeframe. The tanks receiving waste from AY-102 need to be carefully assessed to assure that these receiving tanks do not experience failures. Many of these tanks will exceed their design lives before the retrieval mission is completed. Failures must be expected before all the waste is retrieved and contingencies for such failures be built into this process. Systematic solutions need to be developed that will look at the options available in the tank farms.

The Hanford Advisory Board (Board) believes that pumping leaking tanks must not be delayed in order to protect human health and the environment.

Advice:

Leaking Tanks

- The Board advises DOE to remove the drainable liquid from Single-Shell Tanks, focusing first on leaking tanks.

- The Board advises DOE that waste should be removed from leaking Single-Shell and Double-Shell Tanks as soon as possible.
- The Board advises DOE to request additional funding starting in FY2014 and 2015 for removing waste from leaking tanks.

Sampling

- The Board advises DOE to evaluate the expansion of the sampling program to first include the six Double-Shell Tanks of similar age and design to AY-102, and to then focus on the remaining Double-Shell Tanks. This recommendation expands on HAB Advice #263 Double-Shell Tank Integrity. The Board recognizes that sampling is expensive and difficult; however, the potential costs of a double-shell tank failure are much higher.
- The Board advises DOE to obtain samples close to the bottom of AY-102 to identify the chemicals in contact with the bottom of the tank.

Tank Integrity

- The Board advises DOE to ensure that the integrity assessment documents are updated annually with any new information.
- The Board advises DOE to evaluate lessons learned from the AY-102 event to improve safety culture, especially regarding the reporting and investigation of abnormal events and the conduct of operations.

New Tanks

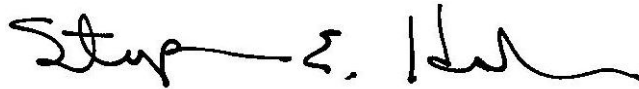
- New tanks are needed. The Board advises DOE to immediately initiate the process for the funding and design of new tanks, and initiate an accelerated process of building new Double-Shell Tanks (HAB Advice #263).

Environmental Monitoring

- The Board advises DOE to provide for monitoring the soil around known leaking tanks to determine the nature and extent of leaked waste, determine possible leak locations, and monitor migration pathways during the retrieval planning process and during and after retrieval operations.

- The Board advises DOE to reinstate a routine monitoring program in the existing Single-Shell tank drywells, giving priority to tanks known or suspected to be leaking and/or containing significant quantities of drainable liquid.

Sincerely,

A handwritten signature in black ink, appearing to read "Steve Hudson", with a stylized flourish at the end.

Steve Hudson, Chair
Hanford Advisory Board

This advice represents Board consensus for this specific topic. It should not be taken out of context to extrapolate Board agreement on other subject matters.

cc: Matt McCormick, Manger, U. S. Department of Energy, Richland Operations
Jeff Frey, Deputy Designated Official, U.S. Department of Energy, Richland Operations Office
Dennis Faulk, U. S. Environmental Protection Agency
Jane Hedges, Washington State Department of Ecology
Catherine Alexander, U.S. Department of Energy, Headquarters
The Oregon and Washington Delegations